

Innovative Technologies for Efficient Pharmacotherapeutic Management in Space

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Current and future Space exploration missions and extended human presence in space aboard the ISS will expose crew to risks that differ both quantitatively and qualitatively from those encountered before by space travelers and will impose an unknown risk of safety and crew health. The technology development challenges for optimizing therapeutics in space must include the development of pharmaceuticals with extended stability, optimal efficacy and bioavailability with minimal toxicity and side effects. Innovative technology development goals may include sustained/ chronic delivery preventive health care products and vaccines, low-cost high-efficiency noninvasive, non-oral dosage forms with radio-protective formulation matrices and dispensing technologies coupled with self-reliant tracking technologies for quality assurance and quality control assessment. These revolutionary advances in pharmaceutical technology will assure human presence in space and healthy living on Earth. Additionally, the Joint Commission on Accreditation of Healthcare Organizations advocates the use of health information technologies to effectively execute all aspects of medication management (prescribing, dispensing, and administration). The advent of personalized medicine and highly streamlined treatment regimens stimulated interest in new technologies for medication management. Intelligent monitoring devices enhance medication accountability compliance, enable effective drug use, and offer appropriate storage and security conditions for dangerous drug and controlled substance medications in remote sites where traditional pharmacies are unavailable. These features are ideal for Exploration Medical Capabilities. This presentation will highlight current novel commercial off-the-shelf (COTS) intelligent medication management devices for the unique dispensing, therapeutic drug monitoring, medication tracking, and drug delivery demands of exploration space medical operations.